

**NEAR-NET-SHAPE POLYMERIZATION PROCESS AND  
PROPRIETARY MATERIALS SUITABLE FOR USE THEREWITH**

**5     ABSTRACT**

10     This disclosure describes a processing approach for the rapid and efficient in-situ polymerization of specially prepared precursor mixtures to achieve near-net-shape production of objects/articles with exact dimensions. The process relies on the use of polymerizable compositions comprised of a mixture of a dead polymer, a reactive plasticizer and an initiator, which compositions are semi-solid-like prior to curing and induce low shrinkage upon curing as a result of their partially polymerized nature prior to processing. The partially polymerized nature of the precursor mixtures also allows extremely impact-resistant objects/articles to be fabricated. Other desirable engineering property attributes can similarly be achieved via the judicious blending of starting ingredients in formulating the polymerizable (curable) mixtures.

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100